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Notes on the lectures of Dr. Benjamin Rush.

Lecture 16th

Aliments — they are divided into animal & vegetable. That both were intended for man I infer ~~from~~ 1st From the structure of his teeth which are omnivorous

2d From the ile heath ~~which~~ follows the exclusive use of either species of diet.

3d From an injunction laid on us in the Scriptures to "Pay & eat" By destroying animals for mans use, room is made for others who else must die for want of sustenance, they are protected from the infirmities of old age, & from much pain as few of them survive a disease of much force — they have no idea of a future state, & suffer only a transient pain which is much less than a man suffers in a fit of the goat or stone. — Every kind of animal, bird, fish & even serpents have furnished a luxurious repast to man at some time or other

(The subject of aliments & cookery are as necessary to a Physician as preparing medicines

Of the wholesomness of aliments. 1st Aliments are wholesome that please the taste & sit easy on the stomach (see Dr. Fothergills observation to Lord Macclesfield) some aliments are not palatable but very digestible & make good chyle - & some aliments that are very palatable disagree with the stomach? -

2d Some aliments do not shew their ill effects on the stomach for years after they are taken. -

3d Some very digestable aliment are very indigestible to some people owing to idiasyncrasy. 4th Age influences aliments at some periods of life butter & other articles formerly agreeable, have become unwholesome -some

5th Habit has a great influence on ele-
=ments. fat pork becomes palatable &
wholesome by habit, so does condiments, &
many other articles of diet. ——

Food is taken at three different times
in the 24 hours — in the present state of
society — But I believe man like other
animals was intended to eat always, so as
to keep the stomach under the impression
of moderate distention. ——

The inconvenience of our intervals between
meals is seen on chickens & people who
eat much oftener. Bartram says
the Indians rise from their beds to eat
which practice has a salutary effect
as it keeps the stomach in motion or under
the constant impression of a gentle stimulus
the vascular & nervous system are kept
in a proper state of excitement. The want
of this excitement has induced the use of
ardent Spirits, Tobacco, opium &c to supply its
place. —

The Roman practice of taking their principle meal about the evening was a good one, as rest is known from experiment to promote digestion, & Sanctorius says that eating in the evening causes more perspiration.

In sleeping after eating the body ought not to be placed in a horizontal posture, the Portuguese sleep sitting on the floor between 2 chairs with the back against the wall. Augustus used to sleep in his chair after dinner. — People who sleep after dinner always rise sick, ill tempered or stupid.

The popular custom of drinking bitters before eating is hurtful, as it either destroys the appetite, or makes it so keen as that we eat too much. — From a knowledge of this fact the Indians never drink water before eating on their long marches

It is better to stay the stomach with a little gingerbread, figs, raisins, these do no injury to the stomach. Drinking at meals when the appetite flags is improper as it invites to excess, & impairs digestion by diluting the gastric juice too much.

The custom of carving has the inconvenience of subjecting the operator to 15 minutes of severe contest with a goose or turkey at a time when he is fatigued, besides spattering clothes & table cloths, he must swallow his food half masticated to avoid being thought ill bred, by eating after other people. The Chinese & Laterly the French disguise the animals on which they dine. This removes the unpleasant ideas of our feeding on an innocent & useful animal. Anthony Benezet being invited to dine with a Gentleman — some fowls were brought on the table cooked in their natural shapes, he refused to eat

on being pressed, what said he would you have me eat my neighbours. In China, or France he would have made a hearty meal on the same animals disguised.

Again the custom of drinking toasts is very absurd, as it compels us to drink more than we want, also stops Modest diffident young men from drinking at all; it moreover breaks the silence necessary to the enjoyment of the sense of taste. The wholesomeness of aliments depends on their solubility in the gastric juice, & their stimulability; which is influenced by 1.st Sex. Females are more tender & easier of digestion than males — and castrated, than those that retain the marks of their virility. —

2.nd Age — Adults are more digestible & stimulating than young animals. Scotch & Welsh mutton is in perfection the 5.th year

3rd The longer animals have been fatten
ing the are the more wholesome. The superi
ority of Irish beef consists in their cattle being
2 years on good pasture fattening.

4th Wild beasts & fouls are more tender
& soluble than tame, owing to their exer
cise. Hence Epicures have introduced the
barbarous practice of bull baiting, the
chace, cock fighting &c. which renders this
flesh so soluble that it passes through the
alimentary canal to soon. Hence people
living on wild animals are unable to do
the work of those living on domestic animals.

5th The fat of meat renders the lean more
digestible.

6th The length of time meat is kept influen
ces its solubility in the gastric juice. Geese
Pigs & Duck contain an oil which becomes
rancid if kept more than 2 days. Turkeys
& fouls are free from any oil of this kind.
Meat will spoil in 2 days in summer, but
may be kept 10 days in winter.

7th In cooking meat, it should be thoroughly done till all the redness disappear, which promotes its solubility in the gastric juice. —

8th The manner of killing animals influences its digestion; according to Dr Franklin Electricity by killing animals, disorganizes more speedily them tenderer than any other mode.

9th Compleat mastication is essential to good digestion. The practice of keeping fowls with their entrails in them hastens putrefaction & gives them a disagreeable taint — moonlight is said to hasten putrifaction. Dr Lynch observed ~~it~~ in the West Indias that fish putrefied very soon by moonligh, the same thing has been observed by Dr Balfour in the East-Indias May it not be owing to the moonlight inviting the flies to deposit their eggs on the fish which hastens putrefaction? Crabs, lobsters, Oysters & Clams are fattest at full moon. —

We now proceed to the several methods of preparing animal food.——

The first is in form of soups. The scotch have their "Hodge & Podge, - Cocka lick & black soup also barley broth — Their Cockalicky is made by boiling the oldest cock they can find with Leek, beets, onions &c and a little beef, a long time - this is seasoned & makes an excellent dish - The name is derived from from the cock & the Leeks. Hodge Podge is made in the Spring by boiling a little mutton with a little Gall the garden vegetables, this is a palatable dish.——

Barley broth is made by boiling a piece of old tough beef & throwing in barley from time to time, to this vegetables & spices are added.

The French make "Soup Gras, and Soup maigre." The first is made by boiling meat lbx in aqua pont lb viii down to lb iv over a slow fire - to which is added butter ℥j vegetables & seasoning

Their Soup Maigre is made by boiling bread buttered bits onions № iv, beef,
Leeks & turnips &c. in aqua lb viii for 4 hours the
flesh remains which is seasoned, & boiled
again to separate all the fat that may
~~remain~~ rise which is indigestible. —

In making soups 4 or 5 simmering over a
slow fire, in a close vessel, extracts the Gluten as the is sufficient,
the fat should be skimmed off as completely as
possible. Boiled meat is the least stimulating
any dressed flesh, & is proper for young people
& convalescents from accute diseases. Mutton
is generally prepared in this way. Strange
as you may think it Geese & Ducks are much
better when cooked in this way. —

3rd Roasting. This is the most usual, savory, sti
=mulating & nutritious mode of cooking meat.
This was the meaning of Isaac when he bade
Esau prepare his venison savory — for it is the
proper food for weak & aged stomachs

4th Broiling (Mutton Chops & beef Steaks are dressed this way. The unrivaled Fame of Peg Mullen, of this city, in preparing beef Steaks consisted in placing the beef on a hot bakeplate & crisping the outside so as to re=tain the juices. The Cornwall miners are acquainted with this fact: they prepare their Steaks by placing the beef on a block of tin at the moment of its passing from a fluid to a solid state. —

5th Baking- This is done with paste in the form of a meat pie. The meat is digestible & wholesome, but the paste sits heavily on the stomach. —

6th Hashes. Dr Franklin preferred mutton roasted, then boiled & made into a Hash. —

Stewed meats are more nutrient than boiled but less so than roasted; less of their mucelage & juices are wasted than by boiling.

8: thly By Frying. Hogs lard or butter is used for this purpose. Mean fat is preferable to either. Fried meat is stimulating but the fat becomes rancid or empyreumatic & indigestible. —

9: thly & lastly Hot Vapor of water. Meat is put into a pot which is placed over another with water in it, over the fire, so as to boil, the meat is thus involved in hot vapor. It is said to be very tender

The next Subject is fish, which is intermediate between animal & vegetable food; it is said by Haller to have been the first food of man because his innocence would lead him to prefer an animal that expires without a groan —

Fish are very putrescent & should be used very soon after death; in Holland they are sold alive — they are easy of digestion, promote perspiration — and are less stimulating than animal food; & of course are proper for convalescents, as a medium between animal & vegetable food. Shell fish when eaten raw

or lightly dressed, are digestible, nourishing & not very stimulating. When fish are boiled the best mode of knowing when they are done is their floating - boiled longer they sink. - No animal food, except a little tongue or ham is proper with a fish diet. ——

During a Lent, of 40 days (in the spring which is a season of plethora) the Catholic Church has wisely confined themselves to a fish diet - which should be imitated by every sect of Christians - as it reduces the quantity of nourishment, & prevents us from eating land animals at a time when they are unwholesome as they are then propagating their species. Animal food is stimulating in the following order / 1st Quadrupeds 2nd Birds, 3rd Fish, 4th amphelious animals, 5th Insects

Condiments assist the digestion of animal food; they are used by mankind to sharpen the appetite. — They are 1st Common Salt, most animals, & particularly man shew an early partiality for it. The Indians substitute ashes for it. — I may mention heat as having the effect of a condiment, food is pleasanter when warm than cold. 2dly Vinegar in moderation is of use in stimulating the tongue to more acute taste; Pickles are vinegar in a solid form. I think Pepper, Horseradish Mustard &c very hurtful unless used very sparingly.

Ketchup is made by digesting mushroom with Salt marine 2 or 3 days, then boiling & adding spices of several kinds. It is a pleasant Condiment with, but seldom used with any other aliment. The English have taught the two frequent use of wine as a Condiment — A little wine

after fish may be useful, but the man is better off who needs no such stimulus

The methods used to preserve animal food are 1st Savage nation preserve it by expeling the moisture with the heat of the sun. 2d By freezing - it must be thawed in cold water 3d By sugar Molasses. 4th By shuting out the air by Lard flour &c. 5th By smoking 6th By Marine Salt, a small quantity appears to be Septic while a large quantity has the opposite effect, nitre is frequently added salt in preserving meat, it improves its color.

An old Sea Captain informed me that cutting out the bones helped to preserve meat of the many methods tried, to preserve hams from worms in hot weather, I am credibly informed that placing them deep in separate in cut straw has succeeded best in the hands of those who have tried all. Portable Patent Soup is a decoction of beef evaporated till it becomes thick, made into Cakes, & requires

only to be boiled in water to form a very good soup. —

Man the Creature of Habit, happily formed by nature to live on almost any thing, in any clime. — In the form of a Tartar he has been known to open the jugular vein of a sheep or goat & take a hearty draught of blood. In that of a Patagonian he has been known to eat the flesh of horses ~~& dogs~~. The society of Philadelphians at St. Domingo inform us of negroes who devour with great avidity putrid carcasses, & some are best pleased with birds of prey. The Brazilians live on figs & dates most part of the year. Tournefort informs us that the poor of Constantinople live during the summer on little else than Cucumbers. This variety in tastes is not peculiar to man. Spalanzani has made

Eagles eat bread & young pigeons good of flesh.

Aliments are different in their nutrient qualities in proportion to the sugar, oil, Mucilage or Gluten they contain. 1st Experiments prove that sugar is the most nutrient of all. Horses & negroes grow fat on it in the west Indias. 2d Pigs of a like age & weight being fed on ~~potatoes~~ parsnips & potatoes seperately; those fed on ~~potatoes~~ parsnips (which contain much sugar) weighed in a given time several ounces more than them that were fed on potatoes. Hence people who travel in a country scarce of provision, may remedy the evil by carrying a less quantity of sugar with them than any other provision for this purpose figs & raisons will be proper.

2d Animal or Vegetable oil is nourishing - one pound of fat meat is more nourishing than 2 of lean, hence the directors of public institutions from works &c will find it their interest to supply their work people with fat meat. — —

3rd Gluten is the least nourishing of these three principles. Gluten by a chemical process may be obtained from wheat & other graminæ, also from potatoes & divers other vegetables.

What quantity of food is necessary for a person daily? 4 lb. of animal, and as much vegetable aliment is sufficient for a healthy labouring adult, but I think less might do. Children & old men eat more than middle aged people

Mr Volney informs us that in some parts of Turkey half a pound is sufficient for a man daily. We often eat more food than is sufficient for nourishment, for the sake of the stimulus, which we know will supply the place of food - as for instance a man in a fever will live many days without aliment here the stimulus of miasmata or contagion supplies the place of aliment. Food ought to be of the temperature of the body at least. Tea & Coffee are stimulating but afford no nourishment except what Cream & sugar they contain. They are a pleasant restorative after fatigue of body or mind, & prevent the abuse of ardent spirits - also in depression of spirits - strong coffee fortifies the body against cold. A person told the father of Anthony Benezet that he thought Tea a slow poison

"I think so too replied the old Gentle-
=man for I have drank it twice a
day these fifty years Damsire alive"

Of Drinks They are 1st fermented
liquors, as wine, malt liquor, Cyder, perry &
2d ardent spirits as Brandy, Rum, Whis-
=key & 3d plain water. ———

Wine is compounded of an acid, spirit, water,
sugar & an unfermented must. They nourish in
proportion to the sugar they contain hence
Malaga Constantia are more nourishing than
Madeira, Port, & Sherry, Fayal &c the lighter
wines are Claret, Burgundy &c which last
contain an acid that often disagrees with
the stomach — Good Madeira is the most stimu-
lant, but in moderate quantity agrees best
with the stomach, it never produces gout which

disease is unknown in the Island of Madeira where 70,000 pipes of that wine is annually used. Brandy corrects the disposition to ferment in low wines. Some correct the acidity by adding lead which renders it sweet by forming the acetate of lead — this may be detected by orpiment (sulph. arsenic) which precipitates a muddy sediment. If sour wine be kept in cool vaults & sugar added it becomes fit for use. — If Sal Soda be added to muddy wine it unites to the fermentable matter & precipitates it. —

Malt Liquors contain much saccharine matter — some acid, water & spirit, they are nutrient, & proper for working active people, but not for the sedentary. Porter is the best of the malt liquors, as its parts are most intimately blended. —

Cyder is apt to induce Gout & Rheumatism. When 2 barrel of Cyder are boiled down to

to one & kept 4 or 5 years, it becomes a wholesome & pleasant drink. —

Ardent Spirits contains a spirit, acid, & water — but no saccharine matter — In every form is unwholesome, but least so in punch. The addition of sugar & lime juice renders it equal to the [illegible] wines — To describe the baneful effects of Spiritous liquors, would require a Thousand Tongues armed with all the ~~eloquence~~ fire of antient & modern eloquence. —

Pure Water. This liquor will ever retain its character for salubrity. Are we parched with thirst, or in a burning fever? nothing but cold water is desired, nothing suits like water, the offended Stomach after intoxication — A taste for pure water leads to long life & good health. —

Of the causes of appetite. Boarhaave ascribed hunger to the action of the internal coat of the Stomach — to the bile in the Stomach, & lastly to the Sliminess of the gastric Juice & the Reliques of former meals. all these causes I grant may produce a morbid appetite but not a natural one —

Vesalius dissected a robber famous for Gluttony & found the ductus Communis Choledochus emptying into the Stomach. —

Natural hunger I believe depends of a relaxation of the Stomach to what I call the hungry point. When it is below this point anorexia want of appetite comes on, in this case Stimuli will excite appetite. Acute Hunger is a most violent Disease — it affects the body & mind to a great degree especially the moral faculty. It has been said hunger will break thro Stone walls. —

But it has done more, this the medium of a diseased moral faculty is has induced mothers to kill & eat their own children & what is still more it has made shipwrecked saitors gnaw their own shoulders for sustainance.

Shame, fear, grief &c suspend hunger, which I consider as a proof of its depending on relaxation of the stomach — in these cases the system is reduced below the hungry point, here we see it resembles sleep — Joy, cheerfulness, & pure air & company of the raise the system above the hungry, as well as sleeping point.

I have heard of people being hungry after sitting 4 or 5 hours at table, the cheerful conversation of the company had raised the system above the hungry point. I do not deny that the bile & gastric juice &c may induce appetite but think it morbid, from something of this kind, patient in the yellow fever who have

the black vomit, sometimes eat heartily.

In hunger the excitability is very much increased. Atwey the poet died suddenly after a long fast by eating a loaf of bread

The smell of food often weakens the appetite. The intense application of the mind impairs the appetite as I before mentioned in the case of Lord Mansfield.

Of the causes of thirst. The seat of thirst is seated in the mouth & fauces. this 2 infer from certain moist & acid fruits & other substances allaying it. The causes of thirst are partial or general. 1st A certain acrimony of the fluids produced by a suppression of urine & fevers. or by eating salt provisions. The first acts generally, & the latter locally.

2d Relaxation & Dryness of the fauces inducing debility to the degree I have called the thirsty point

3rdly Opium Digitalis & other stimulating medicines which induce indirect debility — also fear will produce thirst. —

A portion Physiology has been passed over including the peculiarities of the female female mind & body, Generation, conception, parturition, also nutrition ——

Pathology — Treats of the causes, seats & signs of disorders

Dr Rush divides the causes of disease into remote, predisposing exciting or occasional, and proximate or the disease itself — they are all links of one chain — Let me illustrate this. Cold is the remote cause of an inflammatory fever. The debility brought on by the sedative effects of the cold, acts as the predisposing cause. Exposure to the heat of a stove-room, the vernal sun or exercise, the exciting or occasional cause — The irregular or convulsive action of the arterial system, is the proximate cause or disease itself. — The pain, heat, and thirst, are the symptoms only of disease. Disease from wounds & local contusions are excepted

The disposing debility is of two kinds, direct, & indirect; between which it is necessary to discriminate by fixing a point, or imginary scale of good health, which we will call 50. When Stimuli is applied to raise the system above 60 by acting on the excitability of the system indirect debility is induced — But when there is an abstraction of Stimuli from the system till it sink below 40 direct debility is induced — These 2 are so much alike as to be only distinguished by the causes which induced them. When debility goes far beyond 60 or below 40 it verges to disease which exciting causes soon induce. A great increase of Excitability follows the sudden diminution of Excitement

and debility rendering the system liable to be acted on by stimuli or irritants, as the Hunters calls them, as exciting causes. The increase of Excitability is always great in proportion to the sudden abstraction of Excitement. There appears something like a convertion of the one into the other, from their sudden succession. —

Where debility direct or indirect exists long the excitability is exhausted the excitability of the system, is exhausted so much, as to render great Stimuli necessary to excite it. In some instances there appears to be a quantity of latent excitability, this quantity differs with different stages of life. Death consists in the destruction of both the Excitability & Excitement

The forms of disease or morbid excitement are 1 Convulsive action as in Epilepsy 2d In Spasms as in the asthma — Spasm is tonic or clonic — the first is constant as in Tetanus, the 2d is alternate

3d In great heat, internal or extrnal, as the skin, mouth, stomach, breast &c.

4th In great itching on the Skin either under the arms, — in the pudenda, anus &c. —

5th In a kind of sudden & severe shock, which goes off in a few minutes (thro the head & breast) called Aura Arthritica

6th In what I have called suffocated excitement, where all motion &

sensation sometimes ceases. —

This last form of disease appears in fevers of the most malignant type, but it is the worst form in which they can appear. The abstraction of blood raises the pulse & by bringing back the sensibility of the System, increases all the painful symptoms - its seat is in the blood-vessels.

The above forms of morbid excitement appear occasionally in every part of the body, although they seem to have their peculiar seats. —

Pain varies according as it is seated in different parts of the body. Thus it is acute in membranous parts - Dull & heavy in ~~Parenchy~~ Parenchymatous parts

Lanceolating in the muscles. Gnawing and boring in the bones. Twisting in the bowels. Shooting in the teeth. ——————

Still pain in every different part of the body is a unit, differing only in degree, & depending on the sensibility of the part, & or its degrees of acuteness; this shews the absurdity of Nosologists in enumerating these symptoms as distinct diseases. ——————

Inflammation is a 2d or inferior degree of morbid Excitement. In more violent morbic action there is no inflammation — Morgagni mentions several cases of Cholic & Death where no Inflamation took place, this is the 6 form of morbid Excitement — It occurs in Hydrophobia

Lecture 23d. I have only to add that the proximate cause of disease appears 1st In the blood-vessels. 2d In the nerves. 3d In the ~~nerves~~ muscles. 4th In the lymphatics, or 5th In the bowels. —

Still it is a unit. Morbid or irregular action appearing in one of the 5 forms I mentioned yesterday

Of the remote causes of diseases

They begin before birth from the passions, ~~&~~ amusements, Labor, aliment, and drinks of ~~mothers~~ pregnant women.

2d Accidental injuries & such as result from the ignorance of midwives in parturition 3d the stupid practice of washing newborn children in brandy soapsuds &c. which are too stimulating & you should hear testimony against it for even the air gives the infant irritation.

4 the quantity & quality of the mothers food strong drink & makes the milk stimulating & induces indirect debility in the child

5th Tight swathing cloaths, caps, & oftentimes tight stays, act as remote causes of disease

6th The same causes as those of the 4th death has been induced in children by the intemperate use of spiritous liquor or improper aliment.—

7th The use of ardent sp.ts to allay pain in children often becomes the remote cause of disease in them

8th The premature application of Children to study abstruse subjects—also confined schoolrooms— and the tyranny of schoolmasters which last influences the mental powers of childrens minds— I have often visited sick children, brought home from school, from the above causes

9th Childrens amusements, as running, falls, contusions, bruises, lifting them by the arms &c produce diseases particularly Hydrocephalus internus

We proceed to the influence of the atmosphere as a remote cause of disease. The sensible qualities of the atmosphere are Heat, Cold, Moisture & Dryness. The other causes of disease from the air, are 1st Certain miasmata either marsh or Human 2d It is rendered unwholesome by combustion, respiration, perspiration of animals & plants, also the effluvia of certain manufactories. 3d From certain Winds, as the Samiel, Sirocco & Samoon winds also an over proportion of pure air

First of the sensible qualities of the air as remote causes of diseases.

Altho the human body can bear, without much inconvenience to its functions, a considerable variety in the temperature of the atmosphere, yet the most agreeable sensations are excited when it is about from 62 to 75 of Farenheit, before the 45 year

of life. In old age a higher temperature is necessary. Animals require the universal stimulus of heat in different degrees. 32 or less, may be as stimulating to some animals as 95 is to man. Heat far above 95 degrees, shews its effect on the arterial system, inducing languor, debility, increased excitability, or a disposition to be acted on by stimuli. This is not the case with the West Indians, who never feel the languor from heat, as it is constantly applied.

2d. The direct rays of the sun sometimes acts on the brain, inducing what has been called insolation. sometimes syncope & death, at others in spasms, inflammation, coma, cold sweats, convulsions & death. vide Goodlestone.

3rdly. Heat acts on the nerves. syncope, hysteria & convulsions are common in hot weather & warm climates. wakefulness is often the effect of heat. It dulls the sense of touch.

4thly

Heat induces in the muscular system, languor, debility, & a disposition to involuntary motion, Tetanus &c with an indisposition to voluntary motion Hence the arguments for the necessity of the last & slavery in hot climates.

5. Heat induces in the Stomach excess of appetite, but if long continued loss of appetite; in the alimentary canal it disposes to Cholera morbus, Dysentery &c. Its effects on the appetite is evident in Europeans visiting the East Indias. They indulge their appetites, in a debilitated & face victims to the diseases of that Climate.

6thly Heat acts on the Skin inducing perspiration. Sweat & when greater in degree, eruptions called Sudamina or prickly-heat & dryness of the skin, reopens never give out, as the promise is, till they cease to sweat, this discharge has a saline taste that sometimes causes boils. It darkens the skin as in Indians

7.thly Heat increases the venereal appetite, Hence the early & fruitful mariages in hot climates Boerhaave & others were of opinion that ~~wor~~ children born in cold weather were longer lived than others - I am informed by a man-midwife of extensive practice - that he delivers more women in the winter than in summer, which goes some way to explain the reason why children born at that season appear to live longer

8.thly Heat disposes the blood to putrifact=on which is prevented by the bile according to Dr. M.Clurg - The acrimony of the bile caus=es bilious diseases in hot weather - However I attribute the prevalence of bilious diseases in hot climates to marsh effluvia.

9thly "Heat acts on the eyes. Hence opthalmia, gutta-serena, cataract occur most frequently in warm climates. Opthalmia was very prevalent in the year 1793 in this city, from the heat & dryness of the season. —

10thly Heat induces indirect debility in the Faculties of the mind with the exception of the Imagination which is strong while the memory is weak in hot climates. Naturalists say the desire of imitation is great in hot climates. Lastly heat is friendly to old age. Hence the antient Romans removed in old age to Naples, a warmer climate than Rome, where their lives were prolonged. The Portugese at this day follow their example by retiring in old age to Brazile. In these cases the invigorating influence of the suns rays counteracts the debility of age. But when intense is suddenly fatal to old men. — Thus far we have considered the ordinary effects of heat on the body. —

but its action varies — if the body has been exposed to cold, heat acts with more force, inducing preternatural excitement. In March 1791 a heat of 77 deg produced universal languor in the citizens of Philad^a — while in august it would have been pleasant. Heat succeeding cold causes inflammatory fevers, Hence the old vulgar saying that a green christmas makes a fat Church-yard — Cold succeeding hot weather has the same effect. — Dr Bryden informs us, that the inhabitants of Naples put on warm cloths cloaths when the scirocco winds blow, for the thermometer fell from 112 to 80 degrees — I mention this to shew how relative heat & cold are — Weather uniformly dry & warm are healthy as are the coldest winters when uniformly wet or dry

The summer of 1756 was the warmest the inhabitants of Rome could recollect yet it was so healthy that the Hospitals were nearly empty - in the fall bilious diseases appeared; thus we see diseases generated in one season, appearing in another The long continuance of heat diminishes the sensibility to cold - Hence west Indians require 2 or 3 years to cool them, when they come to this country, as they bear cold better than the natives. ——

If such be the fatal effects of heat it may be asked, why was man first placed in a hot climate (Paradise)? why have the arts flourished in Egypt under an enervating sun? and why are the greatest instances of longevity to be found in hot climates?

I answer the natives of Africa - the East-Indeas, West Indeas &c grow old in the

perfect enjoyment of the faculties of their minds, & health of their bodies while Europeans suffer from intemperance — It is therefore the want of reason to govern us that makes us unhealthy — Our memories fail, in those hot countries.

Mr Townsend informs us that the Spaniards in Madrid by keeping within doors during the heat of the day, & taking light drinks, feels no inconvenience from the heat.

I conclude that most of the diseases induced by heat are to be referred to an error in diet, dress & the exercises of the mind & body.

The effects of heat are different as it is accompanied by moisture & dryness — Travellers on the desarts of nubia obviate the dryness of the air by breathing thro a wet Sponge now & then which is very refreshing

The evaporation from a cup of water on a stove in a close room has the same effect of rendering the air salubrious & respirable

Moderate heat & moisture are seldom injurious

Winterbottom remarks that Summers uniformly rainy & moderate in heat are the most healthy

A moist temperate air like England & Ireland has an effect on the complexion & give a color to the face of the rosy hue.

Cold is a negative quality & no more than the absence or abstraction of heat

That cold is a sedative & infer 1st from the debility induced in the system by cold as travellers & labourers can bear witness

2dly From the slowness weakness & absence succeeded by languor & sleepiness & death. The pulse of a Greenlander is only 40 strokes in a minute

3 From the similarity of effect between cold & bleeding, purging & inducing direct debility in inflammatory diseases.

The supposed tonic effect of Cold Air is no more than abstracting the stimulus of heat, & preventing thereby the indirect debility & excitability which invite diseases. In illustration of this let us suppose the healthy point to be 75°. heat is applied which induces indirect debility to 95 deg. Cool air abstracts 20°. thereby brings the system back to the healthy standard. This is called a tonic. this is of extensive application in practice

Effects of Cold on different parts of the system

1st. In the arterial system it produces debility an accumulation of excitability & an increase of the action of the muscular fibre, predisposing to all kinds of fevers. If the adventurous that went near the north pole say they felt an uneasy sensation in their breasts

2.dly

1. In the organs of voluntary motion, it induces an indisposition to that motion, while those of involuntary motion have their action increased. Hence the saying that man in warm countries was designed to be the slave of those in cold climates as the wills of the women are inactive they must do according to the wills of other people. ——

3.d Cold diminishes nervous sensibility, produces a dull pain in the head, sleep, & death when intense.

4.th Cold invigorates the appetite — Horses eat more in cold than in warm weather. —

5.th It weakens the venereal appetite — this may be to obviate the difficulties of providing for a large family in cold countries

6.th Cold is diuretic by diminishing perspiration. It is said to dull the hearing — also vision is thought to be affected by it — but this may be from the reflection of the snow

ways by the snow so constant in cold countries. Scurvy is referred partly to cold but relaxed solids & vitiated fluids, & drink are partly the cause of it; cold with want of proper food & exercise may cause this state of the system. One degree of cold produces paleness, a greater degree redness of the skin resembling petechia in dead bodies, this is owing to a temporary loss of excitement & excitability in the vessels of the skin; a still higher degree of cold causes gangrene. — Cold diminishes the size of plants & animals; hence the Samoid is but 4 feet high. —

During sleep cold acts with most force owing to the languor of the system in sleep. Hence death from cold follows the night after shipwrec- from the same cause diseases mostly attack at night. Cold makes old ulcers sore after they are nearly well

Cold Succeeding the heat of august destroys the equilibrium of Excitability & Excitment by the abstraction of twenty or 30 deg. of heat & inducing direct debility, this invites bili= ous diseases. Mr Guthrie remarks that catarrhs are unknown in Russia during uniformly cold winters - Pontopides says the same of nor= way; inflammatory fevers never appear till the spring & run into the gangrenous or putrid type for want of reaction in the system - which owing to the sedative effect of cold inducing direct debility & wasting the excitability of the system - from its long application, hence we see diseases generated in one season & brought forth in another. ——

The inhabitants of northern countries by becoming insensible to heat, bear it for sometime better than we do, owing to the long application of cold - this wears off in time

People that endeavor to render themselves insensible to the sensible qualities of the air, put me in mind of the Clown who endeavoured to teach his horse to live without eating which as soon as he had learned, the poor animal died. ———

Great heat suddenly succeeding cold of short duration, causes dangerous or highly malignant fevers, noticed by Vansweeten — The Plague is often excited in this manner. Reason & experience teaches man to avoid the ill effects of cold even near the Poles, by temperance & warm cloathes

Lecture 24th. Moisture increases the sedative effects of cold, by assisting to carry off the heat of the body. 30° is a more disagreable cold in England than 10° in this country; some Russian soldiers who were wintered at Portsmouth declared they suffered more from the cold than they had ever done before. The cold and moist air of Holland makes winter cloaths pleasant the warmest summer day. Cold feet induce catarrhs more frequently than when generally applied to the body. The cold hand of a physician has induced rigors in a patient by feeling the pulse. A current of air passing thro' a small aperture in a room & falling on the back or neck causes stiffness - even laying off a ribbon that has been worn around the neck has caused a catarrh. In these cases cold abstracts the stimulus of heat, which is followed by an increased force in the remaining stimuli, say the blood. This destroys the equilibrium between the excitability & excitement of the

system, Disease is induced. Hence partial application of cold acts more powerfully by than general in destroying this equilibrium. I never prescribe for a chronic patient without directing his feet to be kept warm — as the feet & the mouth are the avenues thro which almost all diseases get into the body — I think I have observed cold windy weather to produce more catarrh than the same temperature & calm.

We go on to consider the variety of these effects at different seasons of the year, & their variations in country & city life See Dr Daignons work on the diseases of the parish of St Nicholas Bologne France 50 degrees N.L. where there dies in the winter 365. In Summer 272. In

Autumn 357 In Spring 292 Autumn appears
here to have the 2 degree of mortality (winter
the first, which differs from this country
In this country we see april the most
fatal month to cronic patients such
as Consumption. Hypocrates & Sydenham
both mean the same thing in different
words viz that the diseases of summer are
not over till midwinter, & the diseases of
winter till midsummer. My experience
is in confirmation of the same thing. Diseases
appear to have a solstice in June & July or
seem to take breath as it were to exchange
one set of destroying weapons for another.
Moisture has an influence on diseases from cold
Mr Bruce informs that his sailors became cowardly from the chillings of a damp night air
Mr Bridone says Catarrhs are mostly caught
in Spain from night air, by serenading, so
much so that it is a gallant thing to salute the
ladies in a hoarse voice

The dews are precipitated during the
fore part of the night & begin to be
heavy about the 20 of august. In 1793
during the prevalence of the fever, Springs
which had been dry, began to run, in
this neighbourhood; this fact I had from
a very respectable source. ——
Frosts to check malignant fevers must
be very severe So as to make ice ——

We now proceed to notice the indefinable
qualities of the air. and first of
Marsh effluvia Heat & moisture are
necessary to the production of this fruitful
source of disease

without heat & moisture, neither fermentation nor putrefaction can take place - the heat must be great, & long continued, moisture is also necessary to exhalation as it by that means gives currency to the miasma, & dry earth gives nothing out for exhalation It is necessary for a noxious exhalation that the moisture be in moderate quantity for when marshy grounds are overflowed the exhalation is pure water & not noxious. — Some years ago, in April the marshy grounds below this city were overflowed & much fish & vegetable matter left to putrify, in vain was sickness looked for, the temperature of april was not sufficient to promote putrefaction, I have this fact from Dr Bond - I have witnessed the same thing since in June, when the weather was too cool to give activity to the putrefactive process I ventured to predict the same but the would continue & it did so

Mr Bruce remarked in his travels that when the seasons were very wet & the marshes overflowed that the surrounding countries were healthy Balzell observed that when there was rain enough to inundate the morasses of Cayenne the negroes were healthy. but if only a sufficiency of rain fell to moisten them diseases uniformly occured. The same thing uniformly takes place in the Delaware state, In the low grounds at the junction of the Delaware & Schuylkill rivers the same thing has been often observed. in 1793 when the weather was dry, no intermittents occured in that neighbourhood. When I speak of heavy rain producing diseas, I only mean a smart shower which just breaks a blue pellicle that prevents the exhalation, this pellicle acts like a shade of lace to prevent morbid exhalations

The matter which causes disease is of so subtle a nature, & the circumstances under which they appear are so various, that people refer to importation & contagion, ~~what~~ diseases depending on domestic causes.

Substances which produce disease by impregnating the atmosphere.

1st Marsh Miasmata from low grounds
2dly Putrid cabbage, vide Dr Rogers of Cork
3dly Putrid Potatoes - A Ship in Tortola lost 12 of her crew by a malignant fever from this cause
4. thly Putrid Pepper — 5. thly Indian meal. 6. thly Carraway seed perishing. 7. thly Putrid Aniseed.
8. thly Putrid onions 9. thly Coffee in a putrid state has generated yellow fever twice in this city 10. thly Putrid Cotton — 11. thly Putrid Flax, Hemp, Hay, Straw 12. thly Putrid canvas
13. thly Rotten books, paper money &c. Log houses the 2 year when the bark of the trees

Causes disease this Dr strong witnessed in the western army, Haller mentions similar circumstances in his Bibliotheca – Capt. Bell observed his crew sickly in a new ship on an East India voyage. Dr Lind has remarked that new ships are unhealthy stagnating air in the holds of ships is a cause of disease – the same air in cellars, also green wood in cellars cause disease, these bad effects are obviated by chimneys in cellars, ventilaters in ships – Bilge water in vessels, Docks, gutters & sewers have contributed to cause disease – Dr Priestly mentions a friend of his who was taken ill by merely stirring a stagnating pond of water – Hog-sties & duck ponds should never be suffered near our houses – Weeds are killed by frost Quarm moist weather succeeds will cause disease by putrifying

Animal ~~bodies~~ substances as human bodies, raw hides, & in one instance a dead whale on the shore of Holland have caused bilious fevers. Dr Gibbon say dead locusts have caused disease.

We have enumerated the principal causes of diseases from impregnation of the atmosphere. On what part of the system do the effluvia act? They sometimes act so violently on the brain as to induce indirect debility in it attended by syncope & even apoplexy. They next act on the stomach & alimentary canal, inducing in the first, a disposition to secrete the matter of black vomit, & in the latter cholic, cholera morbus, dysentery &c. Hence the propriety of exhibiting emetics early in diseases from these sources. The same causes operate on the liver inducing an excessive secretion & excretion of bile. Sometimes the bile is congested in the gall

Sometimes inflammation of that viscus
M. Galvani says a bilious fever was produced
by introducing Hydrogene gas into the Oesopha-
-gus of a fowl — The bile by mixing with
the blood gives the skin a yellow tinge
These miasmata produce in the nervous
system & brain producing headach, convulsion,
madness, coma, apoplexy, palsy & death —
Hence we find yellow fever frequently
ushered in by apoplexy or convulsions —
Miasmata has been said to cause
the dissolved blood, which has erroneous
-ly ascribed to putrefaction — but it is
the effect of the violent action of
the vessels — as it were rending or
tearing it to pieces ———